NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

PH.D DEFENCE - PUBLIC SEMINAR

Title: **Investigating Open Innovation in Services: Empirical Studies of Open Data Initiatives**

Speaker: Mr Yang Zhenbin

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Abstract:

Public sector organizations are making significant investments in information technology (IT) to transform the way in which they serve their external stakeholders e.g., businesses and citizens. Going beyond early efforts to automate existing services, public agencies are seeking opportunities to use IT to enhance stakeholder participation and engagement. A recent step in this direction is allowing the public access to raw datasets through open data initiatives for them to play an increased role in service innovation. This trend towards open data could indicate an increasing reliance by public agencies on their external stakeholders to develop and enhance public services as a result of resource constraints. However, there is little understanding of the open data phenomenon, particularly if public agencies resource dependencies are drivers for their intention to engage in open data initiatives. Moreover, while public agencies that have implemented open data initiatives seek to promote the use of this data by organizing events such as challenge competitions, external stakeholders interest to innovate with open data has been disappointing. In essence, these challenges raise questions about: (1) whether resource dependence of public agencies motivates them to share data, and (2) the reasons inhibiting the demand-side of open data initiatives. This thesis addresses these issues separately in two essays.

From the supply-side perceptive, Essay 1 develops a model that explains how public agencies dependence on various external stakeholders resources can influence their open data sharing behaviour based on resource dependency theory and the resource-based view. Our results of testing the model through a survey of 102 public sector organizations indicate that technical and human resources are two types of resources that public agencies are dependent on their external stakeholders, while there was no significant dependence for financial resource. We further found that public agencies dependence on external stakeholders positively relates to their open data sharing behaviour. Results also suggest that the sensitivity of agency function and public agency conformity needs negatively and positively influence open data sharing behaviour respectively.

Essay 2 examines the reasons hindering the demand-side of open data initiatives from the theoretical perspective of risk-taking by identifying the different sources of uncertainty that potential innovators can consider/perceive when deciding whether or not to innovate with open data. Important uncertainty types (i.e., financial, technological, competitive, demand) were identified from the literature along with a unique type (i.e., data uncertainty) proposed in this study. In addition, we propose the direct and moderating impacts of several psychological variables (e.g., innovativeness, risk taking propensity) of external innovators on their intention to innovate with open data. Findings from testing the model through a survey of 144 potential open data innovators indicate that while financial, technological, demand, and data uncertainty had positive effects on perceived risk of innovating, competitive uncertainty had no effect. Our results also show that risk taking propensity negatively affects perceived risk of innovating, which in turn negatively impacts the intention to innovate with open data. Individual innovativeness had no direct effect but was found to moderate the impact of perceived risk on innovation intention.

Overall, the findings of this thesis contribute to theory building in open data innovation, both from the supply-side and demand-side. In addition, the thesis yields important implications for management of public agencies who are contemplating to launch open data initiatives, and on how to encourage potential innovators to make use of open data.